## AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all earlier versions.

Please amend the claims as follows.

Claim 1 (original). A vertical ammonia converter, comprising:

a vessel having an upright cylindrical shell;

a plurality of fixed bed catalyst zones vertically spaced apart in the vessel, including uppermost and lowermost catalyst zones and at least one intermediate catalyst zone;

at least the uppermost and intermediate catalyst zones concentrically disposed about a respective shell and tube heat exchanger for interstage cooling of effluent gas from said catalyst zones;

magnetite catalyst disposed in the uppermost catalyst zone and high activity catalyst disposed in the intermediate and lowermost catalyst zones;

wherein at least the intermediate catalyst zones comprise at least two mechanically separated catalyst beds disposed vertically with respect to each other and configured for parallel downward gas flow split between the at least two catalyst beds.

Claim 2 (original). The vertical ammonia converter of claim 1 wherein the lowermost catalyst zone comprises at least two mechanically separated

catalyst beds disposed vertically with respect to each other and configured for parallel downward gas flow split between the at least two catalyst beds.

Claim 3 (currently amended). The vertical ammonia converter of claim 1 wherein the upright cylindrical shell has a substantially uniform diameter along the length of the catalyst zones.

Claim 4 (original). The vertical ammonia converter of claim 1 comprising respective pluralities of conduits passing through each respective catalyst bed to effect the parallel gas flow split.

Claim 5 (currently amended). The vertical ammonia converter of claim 1 comprising ~~respective~~ annular flow passages (201) around ~~each~~ the upper one of the catalyst beds to effect the parallel gas flow split.

Claim 6 (currently amended). An ammonia converter, comprising:

an upright cylindrical shell;

at least one fixed bed zone disposed within the shell between an upper gas inlet zone and a lower gas outlet zone and comprising upper and lower catalyst volumes configured for downward gas flow in parallel through each volume;

an annular housing for the catalyst volumes formed by inner and outer concentric shrouds disposing the catalyst volumes in an annulus around a centrally disposed shell-and-tube heat exchanger;

a partition plate in the annular housing disposed between the upper catalyst volume and the lower catalyst volume;

an upper discharge plenum formed between the partition plate and a catalyst support below the upper catalyst volume;

an intermediate inlet plenum formed between the partition plate and the lower catalyst volume;

a gas bypass for diverting a portion of the downward gas flow from the gas inlet zone past the upper catalyst volume to the intermediate inlet plenum above the lower catalyst volume;

a lower discharge plenum below a catalyst support at a lower end of the lower catalyst volume;

a discharge passage in fluid communication between the upper and lower discharge plenums and a shell-side fluid inlet to the heat exchanger;

a shell-side fluid outlet from the heat exchanger in fluid communication with the gas outlet zone.

Claim 7 (original). The ammonia converter of claim 6 wherein the gas bypass comprises a first plurality of tubes passing through the upper catalyst volume and upper discharge plenum.

Claim 8 (original). The ammonia converter of claim 7 comprising a second plurality of tubes passing through the intermediate inlet plenum and lower

catalyst volume, and communicating between the upper and lower discharge plenums.

Claim 9 (currently amended). The ammonia converter of claim 8 wherein the outer shroud depends from an inverted support cone secured between the upright cylindrical shell and an upper end of the outer shroud to form a gas seal therewith between the upper gas inlet zone and the lower gas outlet zone.

Claim 10 (currently amended). The ammonia converter of claim 6 [[~~8~~]] wherein the discharge passage comprises an annulus between the inner shroud and a concentric intermediate shroud having a larger diameter.

Claim 11 (currently amended). The ammonia converter of claim 6 wherein the gas bypass comprises an annulus between the outer shroud and the upright cylindrical shell and a plurality of openings in the outer shroud into the intermediate inlet.

Claim 12 (currently amended). The ammonia converter of claim 11 wherein the outer shroud is supported on a support cone secured between the upright cylindrical shell and a lower end of the outer shroud to form a gas seal therewith between the upper gas inlet zone and the lower gas outlet zone.

Claim 13 (cancelled).

Claim 14 (currently amended). The ammonia converter of claim 12 [[~~13~~]] wherein the discharge passage comprises an annulus between the inner shroud and a

concentric intermediate shroud having a larger diameter and ~~comprising~~ a plurality of openings in the intermediate shroud ~~between~~ to receive fluid from the upper discharge plenum ~~and the discharge passage~~.

Claim 15 (currently amended). The ammonia converter of claim 12 wherein the fixed bed zone comprises a modular pre-assembly attached to the upright cylindrical shell via the support cone.

Claim 16 (original). The ammonia converter of claim 6 wherein the catalyst volumes are filled with catalyst.

Claim 17 (new). The vertical ammonia converter of claim 1 wherein the at least one intermediate catalyst zone and the shell-and-tube heat exchanger comprise a modular pre-assembly wherein the shell of the shell-and-tube heat exchanger comprises a centrally disposed inner shroud of the at least one intermediate catalyst zone.

Claim 18 (new). The ammonia converter of claim 6 wherein the inner shroud forms the shell-and-tube heat exchanger shell.

Claim 19 (new). The ammonia converter of claim 6 further comprising a seal between the outer shroud and the upright cylindrical shell of the vessel to prevent gas from bypassing the fixed bed zone.

Claim 20 (new). A vertical ammonia converter, comprising:

a vessel having an upright cylindrical shell;

a plurality of fixed bed catalyst zones vertically spaced apart, including at least one catalyst zone module independently supported in the vessel above a lowermost catalyst zone;

the at least one catalyst zone module comprising:

a centrally disposed shell-and-tube heat exchanger for interstage cooling of effluent gas from at least two mechanically separated, annular, axial-flow catalyst beds secured to an outer shell of the shell-and-tube heat exchanger and disposed vertically with respect to each other;

passages for parallel downward gas flow split between the at least two catalyst beds concentrically disposed;

an outer shroud having an outside diameter less than an inside diameter of the upright cylindrical shell of the vessel to define an annular space; and

a conical support ring between the outer shroud of the at least one catalyst zone module and the upright cylindrical shell of the vessel forming a gas seal at the annular space and supporting the at least one catalyst zone module.

Claim 21 (new). The vertical ammonia converter of claim 20 wherein the conical support ring is inverted.